

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A method of conserving energy in a node in a wireless network, comprising:

receiving, at the node, a first powering-on schedule from another node in the network;

and

selectively powering-on at least one of a transmitter and receiver based on the received first schedule;

producing a second powering-on schedule based on the first powering-on schedule;

and

transmitting the second powering-on schedule from the node to other nodes in the network when the transmitter is in a powered-on state.

2. (Original) The method of claim 1, wherein the wireless network comprises an ad-hoc, multi-node wireless network.

3. (Original) The method of claim 1, wherein the wireless network comprises a wireless sensor network.

4. (Canceled)

5. (Canceled)

6. (Currently amended) A node in a wireless network, comprising:

a transmitter;

a receiver configured to receive a powering-on schedule from another node in the network; and

a processing unit configured to:

- selectively power-on at least one of the transmitter and receiver based on the received powering-on schedule,
- produce a second powering-on schedule based on the first powering-on schedule, and
- transmit the second powering-on schedule to other nodes in the wireless network when the transmitter is in a powered-on state.

7. (Currently amended) A computer-readable medium containing instructions for controlling at least one processor to perform a method of conserving energy in a node in a wireless network, the method comprising:

- receiving, at the node, a powering-on schedule from another node in the network; ~~and~~
- selectively powering-on at least one of a transmitter and receiver based on the received schedule;
- producing a second powering-on schedule based on the first powering-on schedule;
- and
- transmitting the second powering-on schedule from the node to other nodes in the network when the transmitter is in a powered-on state.

8. (Original) A method of conveying messages in a sensor network, comprising:

- organizing a sensor network into a hierarchy of tiers;

transmitting one or more transmit/receive scheduling messages throughout the network; and

transmitting and receiving data messages between nodes in adjacent tiers based on the one or more transmit/receive scheduling messages.

9. (Original) The method of claim 8, wherein the transmit/receive scheduling messages comprise time schedules for powering-on and powering-off transmitters and receivers at each of the nodes in the adjacent tiers.

10. (Original) The method of claim 8, wherein a destination of the data messages comprises at least one data collection point.

11. (Original) The method of claim 10, wherein the at least one data collection point resides in a lowest tier of the network.

12. (Original) The method of claim 8, wherein at least one sensor node in a tier of the network receives data messages from sensor nodes in a higher tier and forwards the data messages to a sensor node in a lower tier.

13. (Currently amended) A system for conveying messages in a sensor network, comprising:

means for organizing a sensor network into tiers;

means for transmitting one or more transmit/receive scheduling messages throughout the network; and

means for transmitting and receiving messages between sensor nodes in adjacent tiers based on the one or more transmit/receive scheduling messages, wherein at least one sensor node in a tier of the network receives data messages from sensor nodes in a higher tier and forwards the data messages to a sensor node in a lower tier.

14. (Original) A method of conserving energy in a multi-node network, comprising:
 - organizing the multi-node network into tiers;
 - producing a transmit/receive schedule at a first tier in the network; and
 - controlling the powering-on and powering-off of transmitters and receivers in nodes in a tier adjacent to the first tier according to the transmit/receive schedule.
15. (Original) The method of claim 14, further comprising:
 - transmitting a schedule message to nodes in the tier adjacent to the first tier, the schedule message comprising the transmit/receive schedule.
16. (Original) The method of claim 14, further comprising:
 - receiving data messages from the nodes in the adjacent tier when the transmitters for the nodes in the adjacent tier are powered-on.
17. (Original) The method of claim 14, further comprising:
 - transmitting schedule messages to the nodes in the adjacent tier when the receivers for the nodes in the adjacent tier are powered-on.
18. (Original) A system for conserving energy in a multi-node network, comprising:
 - means for organizing the multi-node network into tiers;

means for producing a transmit/receive schedule at a first tier in the network; and
means for controlling the powering-on and powering-off of transmitters and receivers
in nodes in an adjacent tier according to the transmit/receive schedule.

19. (Original) A method of forwarding messages at a first node in a network, comprising:
receiving scheduling messages from a plurality of nodes in the network;
selecting one of the plurality of nodes as a parent node; and
selectively forwarding data messages to the parent node based on the received
scheduling message associated with the selected one of the plurality of nodes.

20. (Original) The method of claim 19, further comprising:
organizing nodes in the network into a hierarchy of tiers.

21. (Original) The method of claim 20, wherein the plurality of nodes reside in a higher
tier than the first node.

22. (Original) The method of claim 20, wherein the data messages are destined for a data
collection point residing in a lowest tier of the network.

23. (Original) A node in an ad-hoc, wireless network, comprising:
a receiver configured to receive scheduling messages from a plurality of nodes in the
network; and
a processing unit configured to:
select one of the plurality of nodes as a parent node, and

selectively forward messages to the parent node based on the received scheduling message associated with the parent node.

24. (Original) A computer-readable medium containing instructions for controlling at least one processor to perform a method of forwarding messages in a network, the method comprising:

receiving scheduling messages from a plurality of nodes in the network;
selecting one of the plurality of nodes as a parent node; and
selectively forwarding messages to the parent node based on one of the received scheduling messages associated with the selected one of the plurality of nodes.

25. (Currently amended) A method of conserving power at a first node in a network, wherein the first node is an intermediate node on a path between one or more other nodes and a second node, the method comprising:

powering-on, at the first node, a receiver to listen for a scheduling messages message;
receiving the scheduling messages message from the second at least one node in the network, wherein the scheduling message specifies a first communication schedule that indicates times at which the first and second nodes may communicate with one another and a second communication schedule that indicates times at which the first node may communicate with each of the one or more other nodes; and

selectively powering-on and powering-off the receiver and a transmitter based on a ~~schedule associated with one of the received scheduling messages~~ the first and second communication schedules.

26. (Currently amended) The method of claim 25, further comprising:

organizing the first node, second node, and one or more other nodes in the network into a hierarchy of tiers.

27. (Canceled)

28. (Currently amended) The method of claim 26 ~~[[27]]~~, further comprising:

transmitting data messages to ~~a node~~ the one or more nodes in a lower tier of the network when the transmitter is powered-on.

29. (Currently amended) The method of claim 26 ~~[[27]]~~, further comprising:

transmitting scheduling messages to the second node ~~nodes~~ in a higher tier of the network when the transmitter is powered-on.

30. (Currently amended) A first node on a path between one or more other nodes and a second node in an ad-hoc, wireless network, comprising:

a transmitter;

a receiver configured to receive a scheduling message ~~messages~~ from ~~at least one~~ the second node in the network, wherein the scheduling message specifies a first communication schedule that indicates times at which the first and second nodes may communicate with one another and a second communication schedule that indicates times at which the first node may communicate with each of the one or more other nodes; and

a processing unit configured to:

power-on the receiver to listen for the scheduling message ~~messages~~, and

subsequent to receipt of ~~at least one of the scheduling~~ message messages, selectively power-on and power-off the receiver and the transmitter based on the first and second communication schedules ~~a schedule associated with one of the scheduling messages~~.

31. (Currently amended) A computer-readable medium containing instructions for controlling at least one processor to perform a method of conserving power at a first node on a path between one or more other nodes and a second node in a network, the method comprising:

powering-on a receiver to listen for a scheduling message messages;

receiving the scheduling message messages from the second ~~at least one node in the network, wherein the scheduling message specifies a first communication schedule that indicates times at which the first and second nodes may communicate with one another and a second communication schedule that indicates times at which the first node may communicate with each of the one or more other nodes; and~~

selectively powering-on and powering-off the receiver and a transmitter based on the first and second communication schedules ~~a schedule associated with one of the received scheduling messages~~.

32. (Original) A data structure encoded on a computer-readable medium, comprising:

first data comprising identifiers of sensor nodes affiliated with a parent node in a network; and

second data comprising a first time schedule for transmitting messages from the parent node to the affiliated sensor nodes and a second time schedule for receiving messages at the parent node from each of the affiliated sensor nodes.

33. (Original) The data structure of claim 32, further comprising:

third data comprising a third time schedule allocating times for the affiliated sensor nodes to transmit to, and receive messages from, other sensor nodes in the sensor network.

34. (Original) The data structure of claim 32, further comprising:

third data comprising an identifier for the parent node.

35. (New) A method, comprising:

receiving messages, at a first node, from neighboring nodes in a network notifying the first node of the neighboring nodes' presence in the network;

determining a first communication schedule that indicates times for communicating with each of the neighboring nodes;

determining a second communication schedule that indicates times for each of the neighboring nodes to communicate with other nodes in the network; and

transmitting a message to each of the neighboring nodes, wherein the message includes the first communication schedule and the second communication schedule.